(hereinafter "Sony"). The Examiner alleges that the prior art teaches a chamber cleaning method by treating a plasma CVD chamber by a gas a mixture of at least one fluorinated carbon, such as CF_4 and C_2F_6. The Examiner admits that Gabric does not expressly disclose $C_3CF{=}CF_2(C_3F_6)$ as a fluorinated carbon cleaning gas. The Examiner turns to Yanagida to say that it is known in the semiconductor art to substitute an unsaturated fluorocarbon such as hexafluoropropene (C_3F_6) as an etching fluorocarbon gas in place of C_2F_6 to remove silicon oxides due to an higher etch rate of C_3F_6.

Contrary to the prior art rejection, the present invention is directed to a novel and non-obvious method of cleaning a plasma CVD chamber using C_3F_6 gas. The prior art fails to teach or suggest a CVD plasma chamber cleaning method which uses C_3F_6 gas. Although, *arguendo*, the prior art may disclose methods of etching semiconductor devices using C_3F_6, the prior art fails to teach or suggest a CVD chamber cleaning method which uses C_3F_6 gas.

Furthermore, the present cleaning method which uses C_3F_6 gas has advantages over prior cleaning methods which use C_2F_6 gas thus establishing secondary considerations of non-obviousness. The fact that the prior art teaches the use of C_2F_6 to etch a semiconductor device does not in any way suggest a CVD chamber cleaning method which uses C_3F_6 gas.

In addition, a recent study documented in Ryuichiro Isaki and Manabu Shinriki entitled "Evaluation of C_3F_6 as Alternative Gas for Plasma CVD Chamber Cleaning", *Tiayonissanngihou*, No. 23, pp. 55-60 (2004) (hereinafter "Isaki", copy enclosed herewith) teaches in its abstract, page 55, C_3F_6 cleaning time was the same as C_2F_6

cleaning time and million metric tons carbon equivalent (MMTCE) of C_3F_6 cleaning was reduced to under 5% when cleaning with C_3F_6 in comparison to C_2F_6 cleaning. Therefore Isaki teaches that C_3F_6 gas provides for a more efficient CVD chamber cleaning with less MMTCE produced.

Prior to the present invention, the CVD cleaning method exclusively used C_2F_6 as the cleaning gas. However, due to environmental concerns, C_2F_6 is not an ideal gas to be used for cleaning a CVD chamber. The Isaki reference demonstrates that C_3F_6 can be used as an effective alternative cleaning gas in place of C_2F_6 to provide similar cleaning properties and a better MMTCE than cleaning with C_2F_6. Thus, Isaki provides evidence that the present C_3F_6 CVD cleaning method is novel and not obvious obvious over prior C_2F_6 gas CVD chamber cleaning methods, for if the C_3F_6 CVD chamber cleaning method was obvious and known in the art, the Isaki study directed to finding an alternative cleaning gas would be superfluous.

Further, the Isaki reference, Figure 2, shows that C_3F_6 is good both with regard to global warming potential (GWP) and National Fire Protection Association (NFPA) rating. Further, Figures 5 and 6 show the SiF_4 emission patterns are similar for C_2F_6 cleaning gas as C_3F_6 cleaning gas.

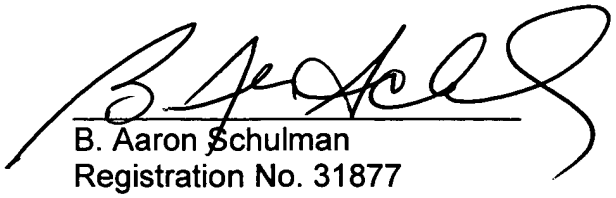
Nowhere in the Examiner cited references do they individually or in combination teach or suggest C_3F_6 is better than the conventional cleaning gas C_2F_6 in total evaluation of cleaning gas properties. Thus, the unexpected cleaning properties of the present method as evidenced by Isaki establish that the present cleaning method of claims 15-20 and especially claims 19 and 20 are not obvious in view of the Examiner cited art.

Based on the foregoing, Applicant respectfully requests that the rejection to claims 15 and 18-20 be withdrawn and claims 16 and 17 found to be allowable over the prior art.

In view of the foregoing, Applicant respectfully submits that the present application is in condition for allowance.

Respectfully submitted,

STITES & HARBISON PLLC



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